

WHAT IS CLAIMED IS:

1. A compressively coded data reproduction method for starting transmission of reproduced data from a video frame and an audio frame corresponding to a reproduction start time specified from the outside, on a data stream in which the following data are multiplexed: compressively coded video data comprising I pictures obtained by subjecting a series of video frames to intra-frame compressive coding, P pictures each obtained by forward-direction predictive compressive coding utilizing the correlation with a video frame in the past, and B pictures each obtained by bi-directional predictive compressive coding utilizing the correlation with two video frames in the past or in the future, or two video frames one in the past and one in the future; compressively coded audio data obtained by subjected a series of audio frames to compressive coding; and additional data relating to the compressively coded video data and the compressively coded audio data, said method comprising the steps of:

separating the compressively coded video data, the compressively coded audio data, and the additional data from the data stream and outputting these data and, at this time, performing head detection on the video frames and the audio frames;

judging whether a detected head frame is a video frame or an audio frame corresponding to the reproduction start time, on the basis of reproduction time information that is one of the

additional data assigned to the detected frame;

making a decoding request for decoding the detected video frame from the compressively coded video data when the detected video frame is judged as a video frame corresponding to the reproduction start time, and making a decoding request for decoding the detected audio frame from the compressively coded audio data when the detected audio frame is judged as an audio frame corresponding to the reproduction start time;

judging whether both of the video frame and the audio frame have been decoded or not; and

requesting synchronous output of the decoded video data and audio data when it is judged that both of the video frame and the audio frame have been decoded.

2. The compressively coded data reproduction method of Claim 1 further comprising a step of judging whether a predetermined period of time has passed or not, before the step of judging whether both of the video frame and the audio frame have been decoded or not;

wherein, when the predetermined period of time has passed, an output request is made for either the video frame or the audio frame, whichever has been decoded.

3. The compressively coded data reproduction method of Claim 1 further comprising the steps of:

judging whether a predetermined period of time has passed or not, before the step of judging whether both of the video frame and the audio frame have been decoded or not; and

notifying the outside that an abnormal condition occurs, when the predetermined period of time has passed and then both of the video frame and the audio frame have not yet been decoded.

4. The compressively coded data reproduction method of Claim 1, wherein the data stream is a program stream defined by the MPEG standard, and the reproduction time information is a PTS (Presentation Time Stamp) defined by the MPEG standard.

5. The compressively coded data reproduction method of Claim 1, wherein the step of performing head detection on the video frames and the audio frames includes the steps of:

judging whether an effective reproduction time information is assigned to the detected head frame or not; and

in the case where no effective reproduction time information is assigned to the detected frame, when the detected frame is a video frame, calculating reproduction time information of the video frame on the basis of display output order information that is one of the additional data of the video frame, and reproduction time information and display output order information of a video frame which has been decoded prior to the video frame; on the other hand, when the detected frame is an

audio frame, calculating reproduction time information of the audio frame on the basis of reproduction time information of an audio frame which has been detected prior to the audio frame.

6. The compressively coded data reproduction method of Claim 5, wherein the display output order information is a temporal reference defined by the MPEG standard.

7. A compressively coded data reproduction apparatus for starting transmission of reproduced data from a video frame and an audio frame corresponding to a reproduction start time specified from the outside, on a data stream in which the following data are multiplexed: compressively coded video data comprising I pictures obtained by subjecting a series of video frames to intra-frame compressive coding, P pictures each obtained by forward-direction predictive compressive coding utilizing the correlation with a video frame in the past, and B pictures each obtained by bi-directional predictive compressive coding utilizing the correlation with two video frames in the past or in the future or two video frames, one in the past and one in the future; compressively coded audio data obtained by subjected a series of audio frames to compressive coding; and additional data relating to the compressively coded video data and the compressively coded audio data, said apparatus comprising:

a system decoder for separating the compressively coded video data, the compressively coded audio data, and the additional data from the data stream and outputting these data and, at this time, performing head detection on the video frames and the audio frames;

a video decoder for decoding the video frames from the compressively coded video data to output video data;

an audio decoder for decoding the audio frames from the compressively coded audio data to output audio data; and

a synchronous controller for judging whether a head frame detected by the system decoder is a video frame or an audio frame corresponding to the reproduction start time, on the basis of reproduction time information that is one of the additional data assigned to the detected frame; outputting a decoding request to the video decoder when the detected frame is judged as a video frame corresponding to the reproduction start time; outputting a decoding request to the audio decoder when the detected frame is judged as an audio frame corresponding to the reproduction start time; and outputting an output request to the video decoder and to the audio decoder at the point of time when both of the video frame and the audio frame have been decoded.

8. The compressively coded data reproduction apparatus of Claim 7 wherein, when only either of the video frame and the audio frame has been decoded after the expiration of a predetermined

period of time, the synchronous controller outputs an output request to either of the video decoder and the audio decoder, whichever has completed decoding at this point of time.

9. The compressively coded data reproduction apparatus of Claim 7 wherein, when both of the video frame and the audio frame have not yet been decoded after the expiration of a predetermined period of time, the synchronous controller notifies the outside that an abnormal condition occurs.

10. The compressively coded data reproduction apparatus of Claim 7, wherein the data stream is a program stream defined by the MPEG standard, and the reproduction time information is a PTS (Presentation Time Stamp) defined by the MPEG standard.

11. The compressively coded data reproduction apparatus of Claim 7 wherein, in the case where an effective reproduction time information is not assigned to the head frame detected by the system decoder, when the detected head frame is a video frame, the synchronous controller calculates reproduction time information of the video frame on the basis of display output order information that is one of the additional data of the video frame, and reproduction time information and display output order information of a video frame which has been decoded prior to the video frame; and

in the above-mentioned case, when the detected head frame is an audio frame, the synchronous controller calculates reproduction time information of the audio frame, on the basis of reproduction time information of an audio frame which has been detected prior to the audio frame.

12. The compressively coded data reproduction apparatus of Claim 11, wherein the display output order information is a temporal reference defined by the MPEG standard.

13. A compressively coded data reproduction method for starting transmission of reproduced data from a picture and an audio frame corresponding to a reproduction start time specified from the outside, on a data stream in which coded video data arranged in non-chronological order, coded audio data relating to the coded video data, and additional data attendant on these data are multiplexed, said method comprising the steps of:

separating the coded video data, the coded audio data, and the additional data from the data stream and outputting these data and, at this time, performing head detection on reproduced pictures and reproduced audio data;

judging whether the detected head picture per screen or head audio data is a picture per screen or audio data corresponding to the reproduction start time specified from the outside, on the basis of reproduction time information that is one of the

additional data assigned to the detected picture or audio data;  
 making a decoding request for decoding the picture per screen  
 and the audio data corresponding to the reproduction start time;  
 judging whether both of the picture per screen and the audio  
 data have been decoded or not; and  
 making a request for synchronous output of the decoded  
 picture per screen and the decoded audio data, when both of the  
 picture and the audio data have already been decoded.

14. A compressively coded data reproduction apparatus for  
 starting transmission of reproduced data from a picture and an  
 audio frame corresponding to a reproduction start time specified  
 from the outside, on a data stream in which coded video data  
 arranged in non-chronological order, coded audio data relating to  
 the coded video data, and additional data attendant on these data  
 are multiplexed, said apparatus comprising:

a system decoder for separating the coded video data, the  
 coded audio data, and the additional data from the data stream  
 and outputting these data and, at this time, performing head  
 detection on reproduced pictures and reproduced audio data;

a video decoder for decoding pictures per screen from the  
 coded video data;

an audio decoder for decoding audio data from the coded audio  
 data; and

a synchronous controller for judging whether the detected



head picture per screen or head audio data is a picture per screen or audio data corresponding to the reproduction start time specified from the outside, on the basis of reproduction time information that is one of the additional data assigned to the picture per screen or the audio data detected by the system decoder; outputting a decoding request for decoding the picture per screen and the audio data corresponding to the reproduction start time, to the video decoder and the audio decoder; and outputting an output request to the video decoder and the audio decoder at the point of time when both of the picture per screen and the audio data have been decoded.